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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/747,004	12/21/2000	Jing-Shan Hu	3366.1	2941

7590 02/10/2005

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EXAMINER

KIM, YOUNG J

ART UNIT	PAPER NUMBER
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1637

DATE MAILED: 02/10/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/747,004	Applicant(s) HU ET AL.	
	Examiner Young J. Kim	Art Unit 1637	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 04 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 December 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Preliminary Remark

The Examiner of record has been changed. All further correspondence regarding this application should be directed to Examiner Young J. Kim whose Group Art Unit is 1637.

All rejections made by the previous Examiner are withdrawn in view of further reconsideration.

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114 was filed in this application after appeal to the Board of Patent Appeals and Interferences, but prior to a decision on the appeal. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on May 4, 2004 has been entered.

Entry of Amendment Request

In the RCE transmittal received on May 4, 2004, Applicants request the entry of Response/Amendment after ***Final*** mailed on March 24, 2004. However, according to the PTO records, Office action mailed on March 24, 2004 was a ***Non-Final*** communication. As the most recent claim amendment was received on July 16, 2003 and no amendment had been filed herewith, the instant office action considers the claims received on July 16, 2003.

Drawings

The drawings filed on December 21, 2000 are acceptable.

Specification

The specification is objected to because on page 31, line 9-11, U.S. Patent Applications are identified only by their Attorney docket number and are missing their respective Serial numbers. Since the Application are recited as being “incorporated by reference,” when amending the specification to recite the corresponding Application serial numbers, Applicants are advised to submit evidence that the serial numbers correspond to the recited attorney docket numbers.

For incorporation by reference to be effective as a proper safeguard against the omission of a portion of a prior application, the incorporation by reference statement ***must be*** included in the ***specification as filed, or transmittal letter-as-filed, or in an amendment specifically referred to in an oath or declaration executing the application.*** An incorporation by reference statement added after an application’s filing date is ***not effective because no new matter can be added to an application after its filing date*** (see 35 U.S.C. 132(a)).

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 15 and 16 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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Claims 15 and 16 recite the limitation "the pool of target nucleic acid" in claim 15 and refer to "pool of target nucleic acids" in claim 16. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1-6, 12, and 15-18 are rejected under 35 U.S.C. 102(b) as being anticipated by Irvine et al. (U.S. Patent No. 5,736,316, issued April 7, 1998).

Irvine et al. disclose a method of detecting a plurality of nucleic acid targets, said method comprising the steps of:

a) hybridizing a capture probe (or mediator), said capture probe comprising a first segment having a target nucleic acid sequence and a second segment having a nucleotide sequence substantially complementary to an oligonucleotide (or cipher probe) bound to a solid phase (column 2, lines 33-40);

b) detecting the hybridization of the target nucleic acid (column 3, line 6).

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The number of capture probes employed by Irvine et al. is disclosed as being between 5-100 (column 5, lines 28-29).

Therefore, Irvine et al. anticipate claims 1, 3, 4, and 12.

The capture probe and the immobilized probe of Irvine is disclosed as being oligonucleotides (column 3, lines 65-67), anticipating claim 2.

The immobilized oligonucleotide probes (or cipher probes) are disclosed as comprising at least 15 bases. This fact is evidenced by the section of the specification which discloses that each capture probe contains, in addition to the sequence substantially complementary to HBV DNA, the following downstream sequence complementary to DNA bound to the solid phase, wherein the sequence comprises 20 bases (column 11, lines 41-45), anticipating claims 5 and 6.

The detection is achieved via fluorescent labeling (column 7, lines 1-6), anticipating claims 15 and 16

The immobilized oligonucleotides of Irvine et al. are disclosed as being immobilized on their 5' end (column 11, lines 66 to column 12, line 17), anticipating claims 17 and 18.

The cipher probe which is synthesized in the direction of 5'-3' direction via photo-directed synthesis (*i.e.*, product-by-process) is structurally in no way different from that of Irvine et al., and therefore, the immobilized oligonucleotides of Irvine et al. would meet the limitations.

Therefore, the invention as claimed is anticipated by Irvine et al.

Claims 1-18 and 21-24 are rejected under 35 U.S.C. 102(e) as being anticipated by Felder et al. (U.S. Patent No. 6,232,066 B1, issued May 15, 2001, filed July 2, 1998, priority December 19, 1997).

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Felder et al. disclose a method of detecting a plurality of nucleic acids in high throughput fashion, wherein said method comprises the steps of:

a) hybridizing the sample with at least 50 different linkers (Figure 1), wherein said linker comprises a first subsequence that is complementary to a target nucleic acid sequence and a second subsequence that is complementary to an anchor probe that is immobilized on an array surface (Figures 1 and 2); and

b) detecting the target nucleic acids (column 3, lines 5-10).

The specification discloses that for each well of 96-well microplates, at least 36 different tests performed using an array of 36 anchor and linker pairs (column 2, lines 16-17), which would result in $36 \times 96 = 3,456$ different anchors and linkers, thereby meeting, “at least 50 different linkers” limitation.

The “linker” probe of Felder et al. is identical in structure to “mediator,” and “anchor” of Felder et al. is identical in structure to “cipher probes” of the instant application, anticipating claims 1, 12, and 21-24.

The linkers and anchors of Felder et al. is disclosed as being oligonucleotides or nucleic acids (column 4, line 51), anticipating claim 2.

As evidenced by Figure 1, the anchor probes (or cipher probes) do not hybridize to the target nucleic acids as well as any nucleic acids of the sample, anticipating claims 3 and 4.

The anchor employed by Felder et al. is, in an embodiment, disclosed as being 25 bases in length (column 29, bottom), anticipating claims 5 and 6.

While Felder et al. state that “the size and physical spacing of the test regions are not limiting,” an example of an area of a test region (*i.e.*, single well, for example) is disclosed as

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being 1 to 40 mm², wherein based on the each test region comprising at least 36 anchors, the array of Felder et al. would necessarily comprise over 3,600 probes per cm², anticipating claims 7 and 8.

The linker (or mediator) of Felder et al. is disclosed as comprising a first region specific for target nucleic acid, wherein said first region comprises about 8 to 50 bases, and preferably 18, 20, 22, or 25 bases (column 11, lines 59-63); and a second region specific for the anchor (or cipher probe), wherein said second region comprises about 8 to 50 bases, and preferably 15, 20, 25, or 30 bases (column 11, lines 37-40), anticipating claims 9-11.

The samples are disclosed as being pool of mRNAs, DNA, RNA, or cDNAs, etc. (column 4, lines 21-24), anticipating claims 13-15.

The detection is disclosed as being conducted via fluorescent moiety (column 8, lines 57-61), anticipating claim 16.

With regard to claims 17 and 18, the anchor of Felder et al. would necessarily meet their limitations because the anchor of Felder et al. is disclosed as being immobilized at its 5' end. The cipher probe which is synthesized in the direction of 5'-3' direction via photo-directed synthesis (*i.e.*, product-by-process) is structurally in no way different from that of Felder et al., and therefore, the anchor of Felder et al. would meet the limitations.

Therefore, the invention as claimed is anticipated by Felder et al.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Felder et al. (U.S. Patent No. 6,232,066 B1, issued May 15, 2001, filed July 2, 1998, priority December 19, 1997) in view of Southern et al. (U.S. Patent No. 6,150,095, issued November 21, 2000, 102(e) date October 6, 1997¹).

The teachings of Felder et al. have been discussed above.

Felder et al. do not explicitly state that the anchors be synthesized in the 3'-5' direction on the substrate.

Southern et al. disclose a well-known technique of synthesizing probes on a substrate in the 5'-3' direction or 3'-5' direction (column 3, lines 5-6), wherein the artisans state:

"The probe may be tethered to a support, preferably by a covalent linkage and preferably through a 5' or 3' terminal nucleotide residue."

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Felder et al. with the well-known knowledge of probe immobilization, as evidenced by Southern et al. to arrive at the claimed invention.

MPEP, at 2143.02, states that the prior art can be modified or combined to reject claims as obvious as long as there is a reasonable expectation of success. Given that the only difference of the claims and that of Felder et al. is the direction in which the probes are immobilized, based on the prior art knowledge (as evidenced by Southern et al.), one of ordinary skill in the art

¹ cited previously in the Office Action mailed on September 24, 2003

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would have had a reasonable expectation of success at immobilizing the anchor probes of Felder et al. at their 3' termini to arrive at the claimed invention.

Therefore, for the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

Claims 19 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Irvine et al. (U.S. Patent No. 5,736,316, issued April 7, 1998) in view of Southern et al. (U.S. Patent No. 6,150,095, issued November 21, 2000, 102(e) date October 6, 1997¹).

The teachings of Irvine et al. have been discussed above.

Irvine et al. do not explicitly state that the anchors be synthesized in the 3'-5' direction on the substrate.

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"The probe may be tethered to a support, preferably by a covalent linkage and preferably through a 5' or 3' terminal nucleotide residue."

It would have been *prima facie* obvious to one of ordinary skill in the art at the time the invention was made to modify the teachings of Irvine et al. with the well-known knowledge of probe immobilization, as evidenced by Southern et al. to arrive at the claimed invention.

MPEP, at 2143.02, states that the prior art can be modified or combined to reject claims as obvious as long as there is a reasonable expectation of success. Given that the only difference of the claims and that of Irvine et al. is the direction in which the probes are immobilized, based on the prior art knowledge (as evidenced by Southern et al.), one of ordinary skill in the art

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would have had a reasonable expectation of success at immobilizing the oligonucleotide probes of Irvine et al. at their 3' termini to arrive at the claimed invention.

Therefore, for the above reasons, the invention as claimed is *prima facie* obvious over the cited references.

Conclusion

No claims are allowed.

Inquiries

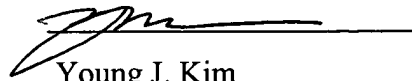
Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Young J. Kim whose telephone number is (571) 272-0785. The Examiner is on flex-time schedule and can best be reached from 8:30 a.m. to 4:30 p.m. The Examiner can also be reached via e-mail to Young.Kim@uspto.gov. However, the office cannot guarantee security through the e-mail system nor should official papers be transmitted through this route.

If attempts to reach the Examiner by telephone are unsuccessful, the Primary Examiner in charge of the prosecution, Dr. Kenneth Horlick, can be reached at (571) 272-0784. If the attempts to reach the above Examiners are unsuccessful, the Examiner's supervisor, Gary Benzion, can be reached at (571) 272-0782.

Papers related to this application may be submitted to Art Unit 1637 by facsimile transmission. The faxing of such papers must conform with the notice published in the Official Gazette, 1156 OG 61 (November 16, 1993) and 1157 OG 94 (December 28, 1993) (see 37 CFR 1.6(d)). NOTE: If applicant does submit a paper by FAX, the original copy should be retained by applicant or applicant's representative. NO DUPLICATE COPIES SHOULD BE SUBMITTED, so as to avoid the processing of duplicate papers in the Office. All official documents must be sent to the Official Tech Center Fax number: (571) 273-8300. For Unofficial documents, faxes can be sent directly to the Examiner at (571) 273-0785. Any inquiry of a

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general nature or relating to the status of this application should be directed to the Group receptionist whose telephone number is (571) 272-1600.



Young J. Kim
Patent Examiner
Art Unit 1637
2/9/05

**YOUNG J. KIM
PATENT EXAMINER**

yjk